Madinaty language school.

Name:……………………………………………………………………

Class:……………………………………..



Science booklet.

2nd. Preparatory.

1st. Term.

Unit 1

1-Lesson 1: Attempts of elements classification.
https://www.youtube.com/watch?v=0Ad04optfXo

2-Graduation of elements properties in the modern periodic table
https://www.youtube.com/watch?v=aRgrB1kfPL4

3-Main groups in the modern periodic table.
https://www.youtube.com/watch?v=Cl4Yd_e6mZw

4-Water.
https://www.youtube.com/watch?v=RZF_he18YM0

Unit 2

1-:Lesson 1 : Atmospheric layers.
https://www.youtube.com/watch?v=uYVlQ4I0VEI

2- Lesson 2 :Erosion of Ozone layer and global warming.
https://www.youtube.com/watch?v=8A3_N99dDsA

Unit 3

1-Lesson 1: Fossils.
https://www.youtube.com/watch?v=SMmc_zmzsc4

2- Lesson 2 : Extinction .
https://www.youtube.com/watch?v=eBow6W9k9LM

Lesson one

Classification of elements

[1] Why scientist try to classify elements ?

1- To be easy to study the elements.
2- To know the relation between the elements its chemical & physical properties.

Trials of classifying elements :

1-Mendeleev's periodic table.
2-Mosley periodic table.
3-Modern periodic table.

a)- Mendeleev's periodic table.

Mendeleev's periodic table was the 1st table to classify the elements.

1-He classify the only known **67** elements in ascending order according to their **atomic masses**.

2-The properties of the elements **repeated** periodically with the beginning of each new period.

So,

*** Group** : arranged the similar elements in **vertical** columns from up to down.

*** Period :** arranged the similar elements **horizontally** from left to right ascendingly according to their atomic masses.

Advantages and disadvantages of Mendeleev's table.

Advantages :

1-He left some spaces(gapes) in his table. (Why?)

Bec he expect discovering new elements in the future

2-He detect the mass number of some new discovered elements which were unknown.

3-He corrected some atomic masses of some elements which were calculated wrongly.

Disadvantages :

1-He arranged some elements **wrong** according to their **atomic mass.** **(why?)**

to put them in groups suitable to their properties.

2-He put more than one element in the same place (cell).

because he considered the element and its isotop as 2 different elements as they have the same mass no.

b)- Mosley Periodic table

Discovering of Mosley Periodic table :

1-The scientist **Rutherford** discovered that the nucleus of the atom contains positive protons.

2-Mosley discovered that the repeated properties of elements depends on their **atomic number** & not on their **atomic masses** as Mendeleev's believed.

Mosley arranged the elements in his table **ascendingly** according to their **atomic number**.

The changes of Mosley Periodic table to Mendeleev's table.

1-Arrange the elements ascendingly according to their atomic number

2-He add the noble gases (inert gases) in zero group.

3-He classify the elements in the same period into 2 groups A& B

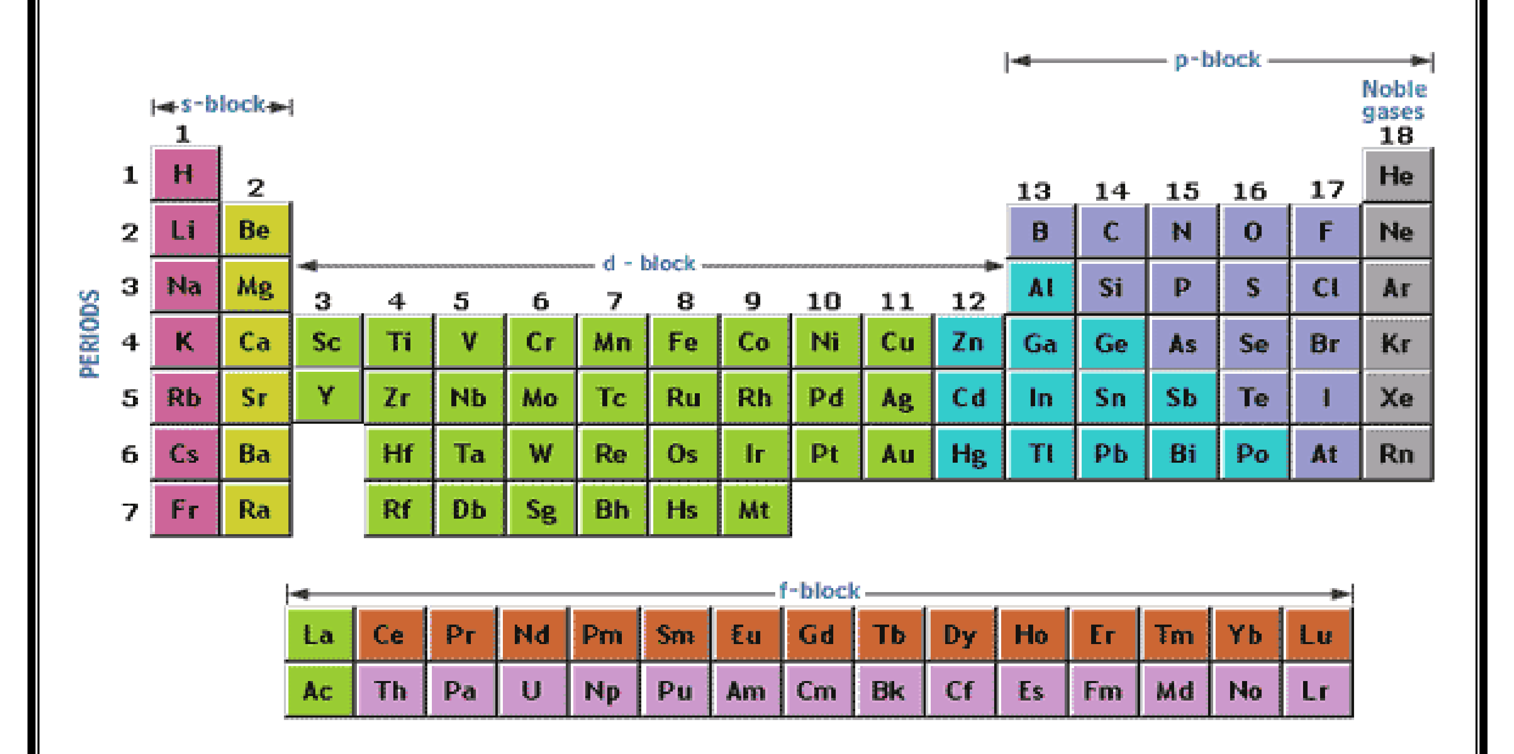
4-Specify place below the periodic table for

Lanthanides Actinides.

c)-Modern Periodic table

1- The scientist **Bohr** discovered there are **seven** principal energy levels in the heaviest element.

2-He discovered that each **principal** energy level consists of **sublevels** called **(S , P , d , F)**



Mendeleev's periodic table	**Mosley's periodic table.**	**Modern periodic table.**
Arrange elements ascendingly according to their mass number.	Arrange elements ascendingly according to their atomic number.	Arrange elements In ascendingly according to * their atomic number * distribution of electrons In Energy sub levels.

-Description of the Modern Periodic table :

* The no. of known elements till now is **116** elements.

* the modern periodic table contain
  …**7** horizontal periods
  …16 vertical groups & **18** vertical columns.

☺ The modern periodic table has 4 basic blocks called (**s , p , d , f**)

S-Block elements (1 A , 2 A)

Are 2 groups have the symbol A at the left side of the periodic table.

d- Block element (transition elements)

-Starting from period **4** and they are 10 groups in the middle of the periodic table.
-Have the symbol B except group 8 which has 3 columns.

P- Block elements(3A,4A,5A,6A,7A & 0)

Are 6 groups at the right side of the periodic table having the symbol A except zero group (inert gases).

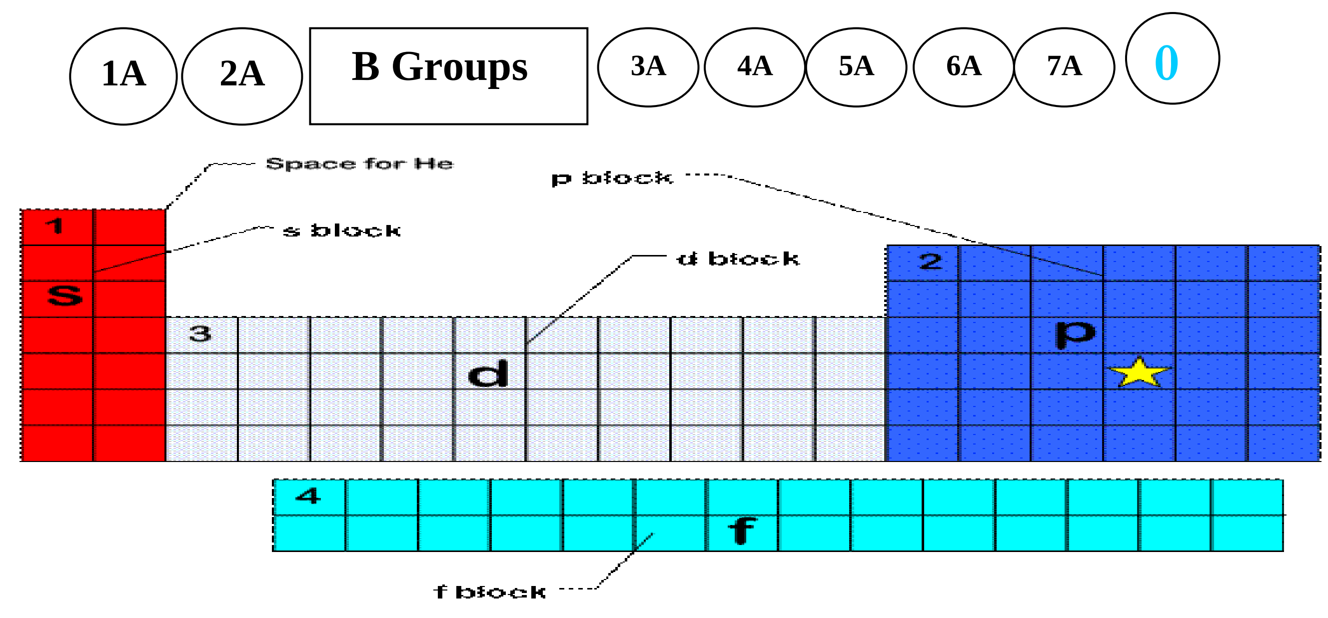
F -Block element.

at the end of the periodic table there are lanthanides & Actinides.

* The new number of the zero group is **(18**) & group **5A** is **(15)**

Conclusion :

Elements of groups A were put in the left and right sides of the modern periodic table and in between there were the group B.

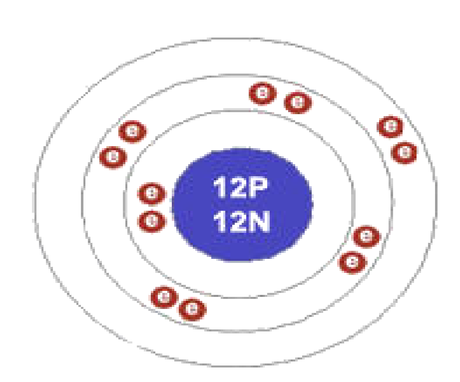


To know the position of an element in the periodic table:-

1) Write the electronic configuration.

2) The group number = the no. of electrons in the outer energy level.

3) The period number = the no. of energy levels.



Example $_{12}$Mg (2, 8, 2)

Group 2A since it has only 2 electrons in the outer energy level.

Period 3 (since it has 3 energy levels)

To detect the atomic number of

the element from its position in the periodic table

1-Determine the number of energy levels to know the period number.

2-Determine the number of electrons in the outer shell to know the group number.

Example:

Calculate the atonic number of an element lies in group zero and period 3A

Solution:

Period 3A →)))

Group Zero

Outer most energy levels Contains 8 electrons

So →)))
2 8 8

So the atomic number is 2+8+8 = 18

Date:---- /----- /-------

Exercise

(1) Complete the following statements :

1-The transition elements starts from period ………………………

2-The new group number of the zero group is ……., while that of the group 5A is…………..

2) Choose:

1.Number of elements located in the third period of the modern periodic table is …………..

a.18 b.8 c.2 d.32

2.The properties of the element which has atomic number equal 17 similar to the element which has atomic number equal ……………

a.11 b.20 c.9 d.7

(3) What are the atomic numbers

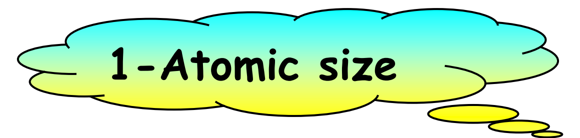
a- An element located in the third period & in the first group.

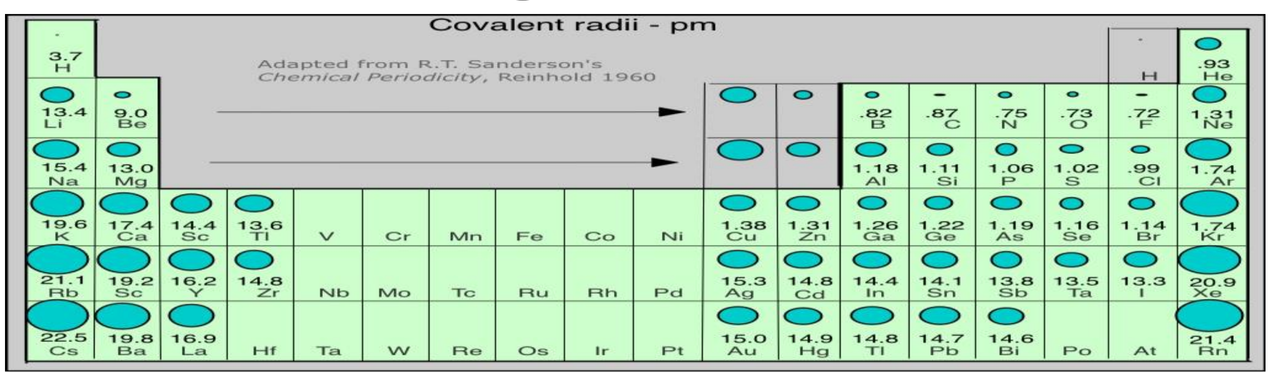
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Lesson two

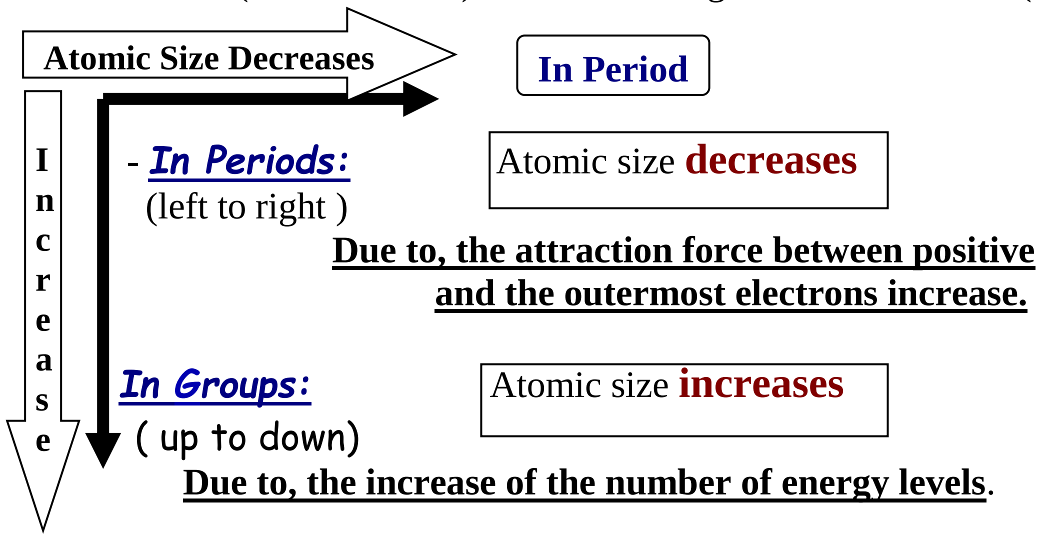
Graduation of the properties in the modern periodic table

1- Atomic size. **2- Electro negativity.** **3- Metallic & non-metallic properties.**





- It can be known from (Atomic radius) - Its measuring unit: **Pico meter** (**Pm**)



Atomic Size Decreases **In Period**

Increase

- ***In Periods:*** (left to right)

Atomic size **decreases**

Due to, the attraction force between positive and the outermost electrons increase.

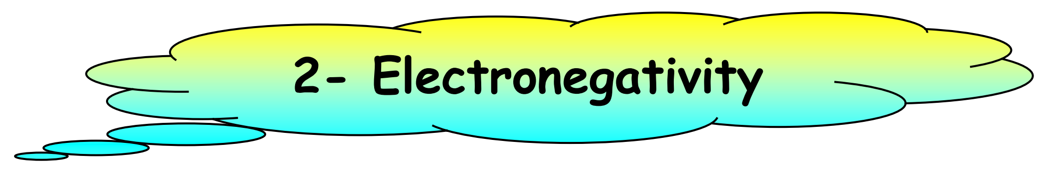
In Groups: (up to down)

Atomic size **increases**

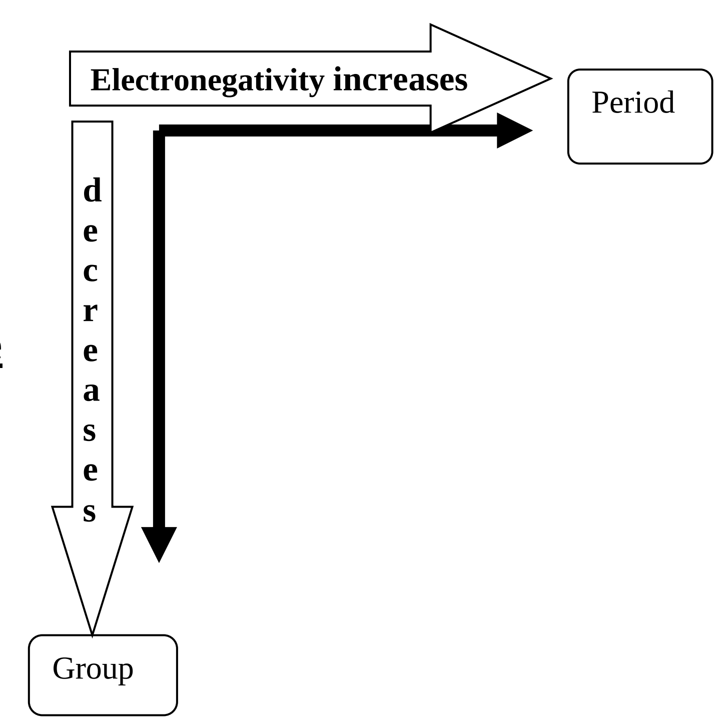
Due to, the increase of the number of energy levels.

Fluorine (F) → **smallest atom** → top right side

Cesium (Cs) → **the largest atom.** → bottom left side



(It is the ability of the atom to attract the electrons of the bond)



- ***In Periods:***
  (from left to right),
  The Electronegativity **increase.**

Due to decreasing of atomic size

- ***In Groups:***
  (from up to down),
  The Electronegativity **decrease**.

Due to increasing of atomic size

Fluorine (F) which lies at the top right has the highest electronegetivity (which equals(4)

N.B.: if the difference in electro negativity between two elements of a compound

More than 1.7
The bond between them is **ionic**

Less than 1.7
The **bond** between them is **Covalent**

In Covalent Compounds

If the **difference in E.N.** between elements is **relatively high**

Polar Compound

Ex. Water molecule **(H_2O)**

Ammonia molecule **(NH_3)**

If the **difference in E.N.** between elements is **relatively low**

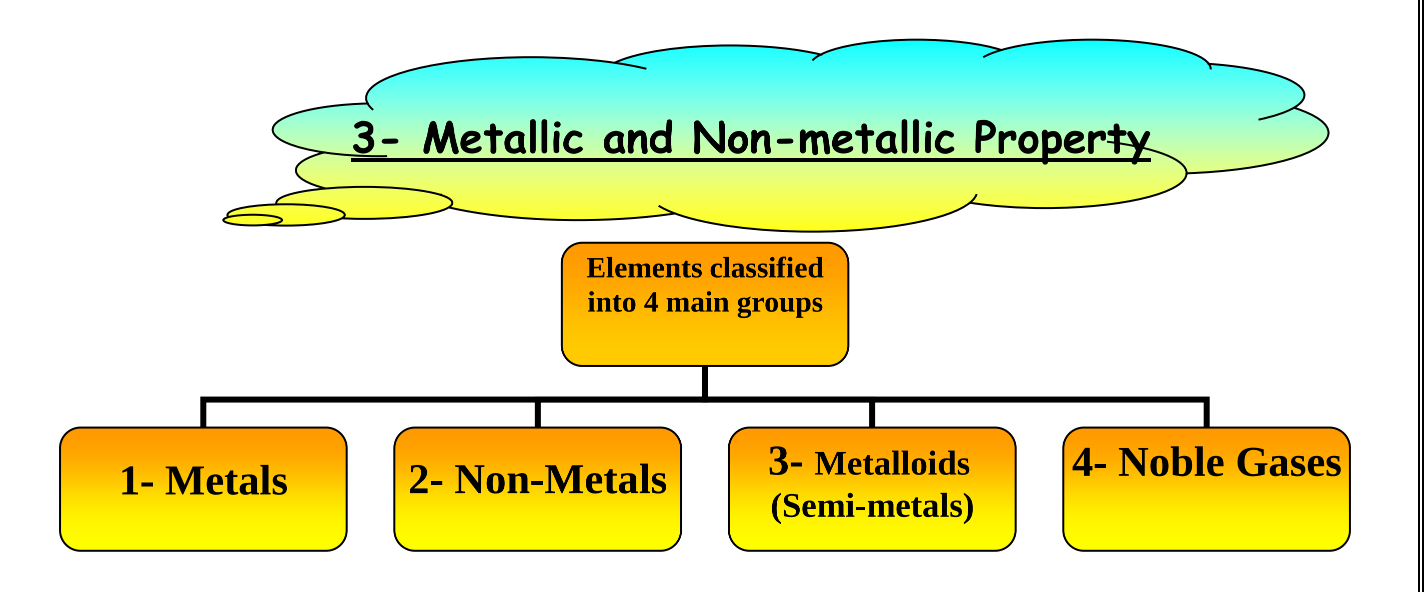
Non- Polar Compound

Ex. Methane molecule **(CH_4)**

Hydrogen Sulphide **(H_2S)**

Point of comparison.	**Methane molecule (CH_4)**	**Water (H_2O)**
Electronegativity of elements	C = 2.5 & H = 2.1	O = 3.5 & H = 2.1
The difference in electronegetivity	2.5 – 2.1 = 0.4	2.5 – 2.1 = 0.4

G.R. Ammonia is considered from Polar covalent compounds
because the difference in electronegetivity between elements is relatively high



1- Metals:-

- They are elements which have **less than 4 electrons** in their outermost energy level.

- **During chemical reaction**; they **lose** the electrons from the outermost shell and change into **Positive ion.**

- ***Ex***. **$_{12}$Mg: (2, 8, 2)** Lose 2 electrons → **Mg^{+2} (2, 8)**

(similar to the electronic configuration of nearest noble Gas ($_{10}$Ne): 2, 8

2- Non – Metals:

- They are elements which have **more than 4 electrons** in their outermost energy level.

- **During chemical reaction**;

they **gain** electrons to the outermost shell and change into **Negative ion**.

- ***Ex***. **$_{16}$S: (2, 8, 6)** gain 2 electrons → **S^{-2} (2, 8, 8)**

(similar to the electroning Configuration of nearest noble Gas ($_{18}$Ar): 2, 8, 8)

3- Metalloids (Semi – metallic elements):

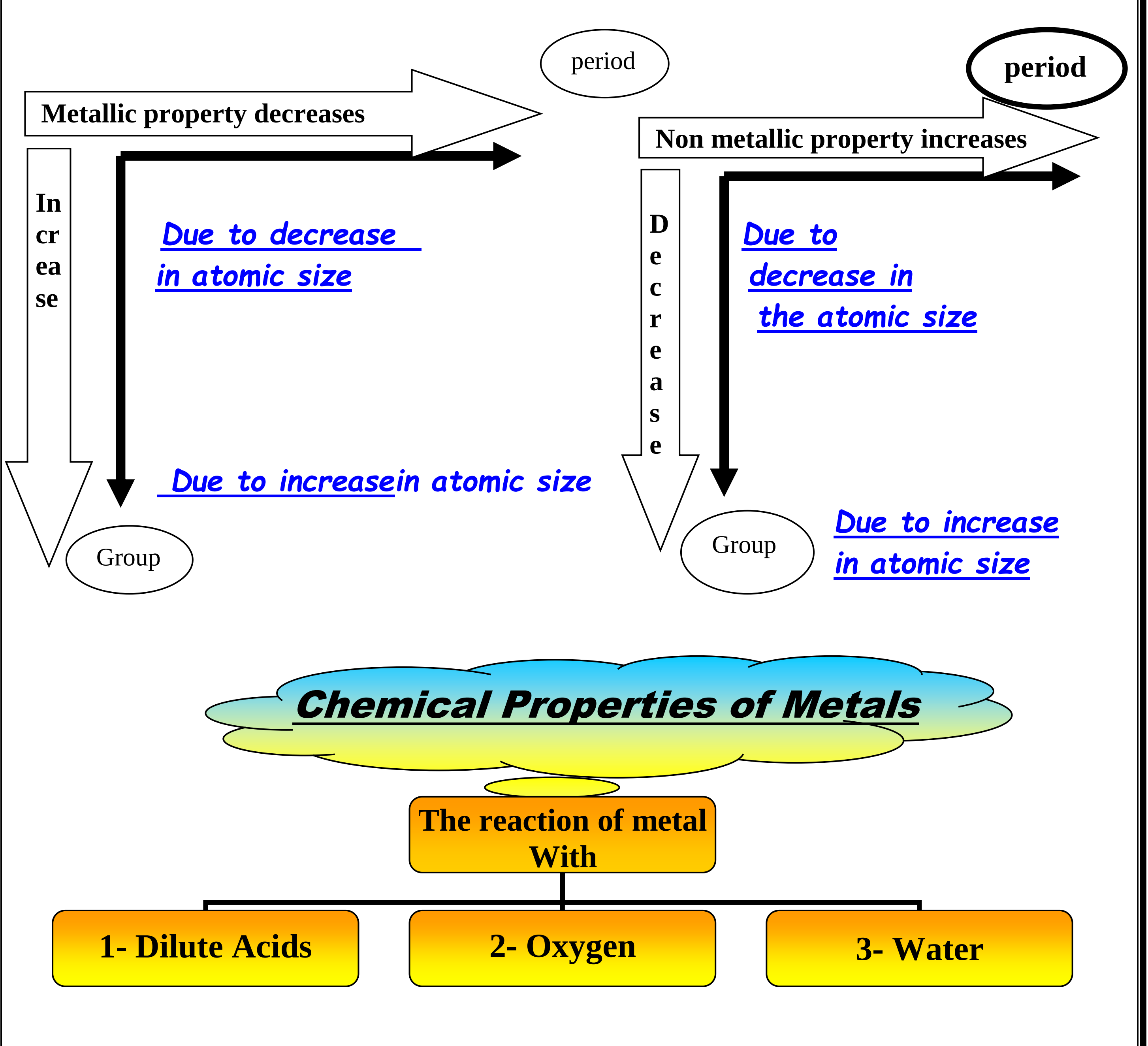
- They are elements which **have the properties of both metals and non – metals**.
- The **no. of electrons** in the outermost energy level **varies** from **3 to 6**.

Graduation of metallic and non-metallic property in the modern periodic table:

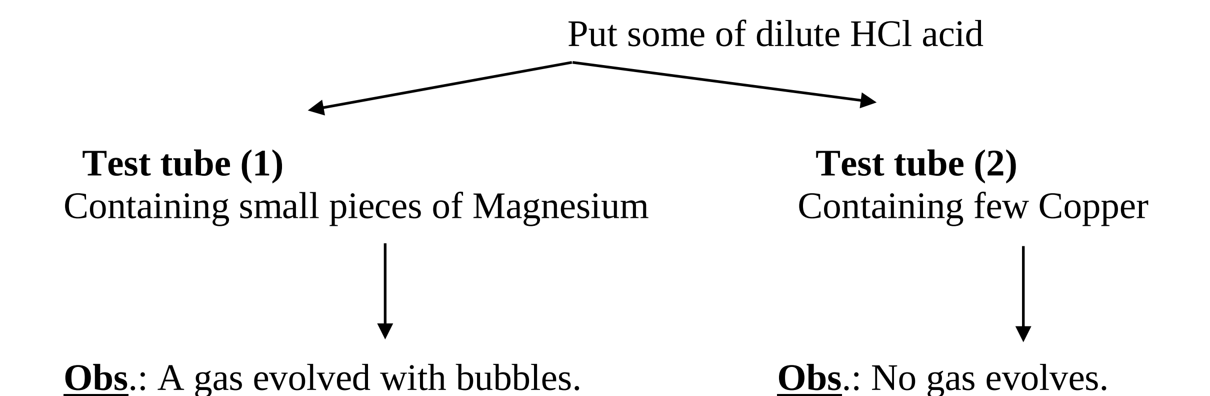
- In periods:-

Metallic property decreases while Non-metallic property increases. →

- The period **starts by strong metal** (1A) then metallic property **decreases** by the increase of atomic no., till we reach **metalloids**, then **non-metallic property appears** and **increases** by the increase of atomic no. till we **reach the strongest non-metal (7A)** before zero group of **inert gases**.



1) Reaction of metal with dilute acids:



Put some of dilute HCl acid

Test tube (1)
Containing small pieces of Magnesium

Obs.: A gas evolved with bubbles.

Test tube (2)
Containing few Copper

Obs.: No gas evolves.

Conclusion:

- Some **active metals** (as Mg & Zn) react with dilute acids (as HCl) Gives (salt + H_2)

$$Mg + 2HCl \xrightarrow{dilute} MgCl_2 + H_2 \uparrow$$

Magnesium | **Hydrochloric acid** | **Magnesium Chloride** | **Hydrogen gas**

Inactive metals

(as Copper (Cu)) don't react with dilute acids (as HCl)
No gas evolves

$$Cu + HCl \xrightarrow{dilute} \text{No Reaction.}$$



2) Reaction with Oxygen:

Magnesium strip burns with bright light and Magnesium Oxide (MgO) is formed Its solution turns red litmus paper into **blue** .

Note:
Iron Oxide doesn't dissolve in water.

Conclusion:

- Some metals (as Mg & Fe) react with Oxygen —giving→ Metal Oxide (Basic Oxide).

$$2Mg + O_2 \xrightarrow{\triangle} 2MgO$$ (Magnesium Oxide)

- Some metal (**basic**) oxides (as MgO) dissolve in water giving alkali which turns litmus solution into **blue**.

$$2MgO + H_2O \longrightarrow Mg(OH)_2$$ (Magnesium hydroxide).

- Some metal oxides (as iron Π oxide) don't dissolve in water.

3) Reaction with water:

- It depends on the position of metal in (chemical activity series).

Chemical activity series:

- It is a series in which metals are arranged in a descending Order according to their chemical activity.

Metals	Reaction with water
Potassium **K** Sodium **Na**	- They react **instantly** with water and **hydrogen gas** evolves Burning with **pop sound**.
Calcium **Ca** Magnesium **Mg**	- They react **very slowly** with cold water.
Zinc **Zn** Iron **Fe**	- They react with **hot water** vapor at high temperature only.
Copper **Cu** Silver **Ag**	- They **don't react** with water.

Chemical Properties of Non-Metals

`

The reaction of Non-Metal With

1-Dilute Acids

2- Oxygen

1) Reaction of non-metals with dilute acids:

(A)

- Add some dilute HCl to test tube contain piece of **coal** (**Carbon**).

(B)

- Add some dilute HCl to test tube a contain a piece of **sulfur**



Non-metals don't react with dilute acids.

2) Reaction of non-metals with Oxygen:

- Non-metals react with Oxygen giving nonmetal oxide (Acidic Oxides).

$$C + O_2 \xrightarrow{\triangle} CO_2$$ (Carbon dioxide)

- Nonmetal (**Acidic**) oxides dissolve in water forming acidswhich turns litmus solution into **red**.

$$CO_2 + H_2O \longrightarrow H_2CO_3$$ (Carbonic Acid).

Date:---- /----- /-------

Exercise 2
Graduation of Elements

1-Choose:

1-The number of electrons located in the ion of trivalent metallic element, whose electron orbit in three energy levels is ……

a.3 b.8 c.10 d.13

2-All the following react quickly with water except……..

a. Na b. Li c. K d. Cu

3-Gas evolved from burning carbon..

a. oxygen b. Chlorine c. hydrogen d. nitrogen

(2) Write the scientific term :

1-They are the elements which have the properties of both metals and nonmetals

(…………………….)

2-It is the measuring unit of the atomic size of the element. (……………………..)

3-It is the ability of the atom in covalent molecule to attract the electrons of the bond towards itself. (……………………….)

4-They are covalent compounds in which the difference in Electro negativity between elements forming their molecules is relatively high.

(………………………….)

Lesson three

Main groups in the modern periodic table

First group : Group

1) They are known alkali metals.

Bec., they react with water forming alkaline solution (metal Hydroxide)

2)Monovalent metals.

They lose one electron during chemical reaction.

3) The metallic properties increases from top ⟶ bottom

1A



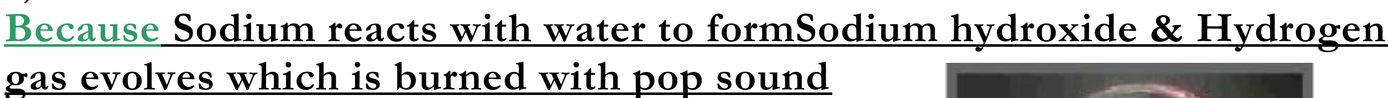
4) Lithium has the least metallic property while
Cesium has the most metallic property

5) **Francium** is a radioactive element.

6)They have **low density** except Cesium.

7)They are good conductor of electricity.

8) Alkaline metals are stored under Kerosene.


Because **Sodium reacts with water to formSodium hydroxide & Hydrogen gas evolves which is burned with pop sound**

$$2Na + 2H_2O \longrightarrow 2NaOH + H_2 \uparrow$$

9)They exist in block S

10) They don't found in nature **bec., they are very active metals.**









B) Halogens (Group [17] or [7A])

a- * Located on the right side of the table before the inert gases.
 * They are the elements of group 17 in P-block.
 * They are named Halogens .

Bec., They react with metals forming salts

2 K + Br_2 ⟶ 2 KBr (Potassium Bromide).
2 Na + Cl_2 ⟶ 2 NaCl (Sodium Chloride).

b- They are mono-valent elements.

Bec. They gain one electron during chemical reaction.

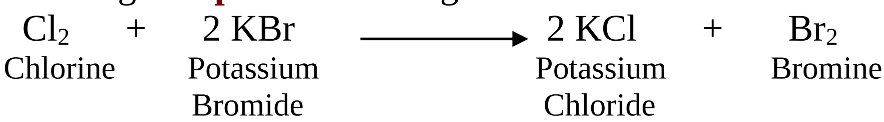
c- They exist in the form of diatomic molecules (F_2, Cl_2, Br_2 & I_2).
Their physical state is graduated from gas to liquid to solid.

Fluorine	*Chlorine*	*Bromine*	*Iodine*
Gas		Liquid	Solid

5-they don't exist in elementary state but found in the form of **chemical compounds.**

Bec., They are active non-metals

6- Each halogen **replaces** the halogen **below** it in its salt solution.



Cl_2 (Chlorine) + 2 KBr (Potassium Bromide) ⟶ 2 KCl (Potassium Chloride) + Br_2 (Bromine)

Cl_2 (Chlorine) + 2 NaBr (Sodium Bromide) ⟶ 2 NaCl (Sodium Chloride) + Br_2 (Bromine)

Br_2 (Bromine) + 2 KI (Potassium Iodide) ⟶ 2 KBr (Potassium Bromide) + I_2 (Iodide)

2KCl (Potassium chloride) + Br_2 (Bromine) ⟶ No Reaction

2 KBr (Potassium bromide) + I_2 (Iodine) ⟶ No Reaction

Properties of elements and their uses

Element	Its Uses
1- Sodium ($_{11}Na$) **(Liquid state Metal)**	- Used in **transferring heat** from inside the nuclear reactor to outside. - Generate electricity.
2- Cobalt ($_{27}Co$) **(Radioactive Cobalt 60)**	- Used in **food preservation**, **Bec. It radiates gamma rays which prevent the reproduction of microbial cells but don't harm human.**
3- Silicon ($_{14}Si$) **(Metalloid)**	- **Silicon slides** used in the manufacture of **electronics** such as: computer. **Bec. It is a semi-conductor**.
4- Liquefied Nitrogen ($_{7}N$) **(Non-Metal)**	- Used in **the preservation of cornea** of eyes, **bec. It has low boiling point (-196°).**

Date:---- /----- /-------

Exercise

Main groups in the modern periodic table

A)Complete the following equations :-

1- Mg + 2HCl $\xrightarrow{\text{Dil.}}$ ………… + $H_2 \uparrow$

2- Cu + HCl $\xrightarrow{\text{Dil.}}$ ………….

3- 2Mg + …… $\xrightarrow{\Delta}$ 2MgO

4- MgO + H_2O $\longrightarrow$ ……………….

5- C + O_2 $\xrightarrow{\Delta}$ ……………

6- 2Na + $2H_2O$ $\longrightarrow$ ………….. + $H_2 \uparrow$

7- I_2 + 2KBr $\longrightarrow$ ………………… + ……………………..

B) Give reason for :

1) Liquefied nitrogen is used in preservation of cornea of eye.

……………………………………………………………………………………

2) Group 1A and group 7A not found in nature.

……………………………………………………………………………………………

Lesson (4)

The Water

Importance of water

1- No living organism can live without water

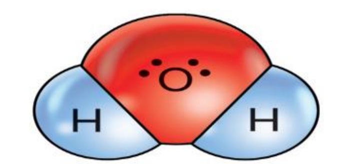
because it is the medium through which all vital processes take place in.

2-Water in oceans and rivers is an important means for transportation between cities and countries.

3- Waterfalls are used in generating electricity in many countries.

In Egypt we use Nile River water (High Dam) to generate electricity

Sources of water



1.Water areas (such as rivers, oceans, seas,.)

2. Rains. 3. Springs 4. Wells.



Structure of water

Water molecule is formed by combination of one oxygen atom (O) with two hydrogen atoms (H) by two *single covalent bonds*,

Give reason

1- Water has high boiling point

Bec. Water molecule are linked together by *"hydrogen bonds"*.

Hydrogen bond :
It is a weak electrostatic attraction force that arises between the molecules of polar compounds (as water molecules).

Note: ***Hydrogen bond is weaker than covalent bond.***

Properties of water

1- Water exist in three states (solid - liquid - gas)

2- Pure water boils at 100° C & freezes at 0°C

3- Water is a good polar solvent.

1-Pure water boils at 100°C and freezes at 0°C

The high boiling point and the low freezing point of water .

due to the presence of hydrogen bonds between water molecules.

2- water is a good polar solvent :

- Water is a good polar solvent so, it has a great ability to dissolve most ionic compounds such as table salt (sodium chloride).

- Water can also dissolve some covalent compounds such as sugar.

Bec., sugar can form hydrogen bonds with water.

- Some covalent compounds such as oil can't dissolve in water.

Bec., oil can't form hydrogen bonds with water.

3- Water density decrease on freezing:-



- Unlike most materials, the density of water in solid state (ice) is lower than its density in liquid state.

This is because :

- When the temperature of water decreases than 4°C, water molecules are collected together by hydrogen bonds forming ice crystals which have hexagonal shape, large volume and large number of spaces between them.

- Ice crystals float on the water surface and this helps in the preservation of the life of aquatic creatures in it.

G.R. 1. Although water of oceans freezes at polar zones, the aquatic creatures are still alive.

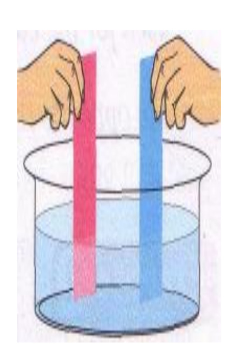
Because when the temperature of water decreases than 4°C, it forms a layer of hexagonal ice which floats on the water surface and this provides the creatures with the chance to still alive.

2. On putting a glass bottle completely filled with water in a freezer, it breaks.

.Because when water freezes, its volume increases so, the bottle breaks (explodes).

Chemical properties of water :

[1] Water has a neutral effect :



-Water has a neutral effect on both litmus paper (red and blue).

Bec., when water ionizes, it gives equal numbers of:

Positive hydrogen ions (H^+) which are responsible for the acidic property.

Negative hydroxide ions (OH^-) which are responsible for the basic property.

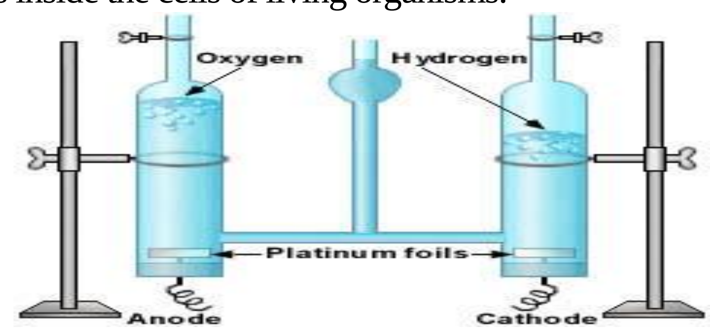
[2]Resistance of water to decomposition:

Water doesn't decompose into its elements (oxygen and hydrogen) under normal conditions or even by the effect of heat.

This property helps to keep the aqueous solutions inside the cells of living organisms.

"Water electrolysis" :

• Hofmann's Voltmeter is an apparatus used for the electrolysis of acidified water



1. *In Hoffman's voltmeter amount of H_2 gas is double O_2 gas. OR*

In Hoffman's voltmeter amount of O_2 gas is half H_2 gas.

Bec., each water molecule (H_2O) contains 2 hydrogen atom and 1 Oxygen atom.

2-During electrolysis of acidified water by Hofmann's Voltammeter, oxygen gas evolves at the anode, while hydrogen gas evolves at the cathode.

Because oxygen ions are negatively charged so, oxygen gas evolves at the anode, while hydrogen ions are positively charged so, hydrogen gas evolves at the cathode.

3-Adding few drops of dilute sulphuric acid to water during its electrolysis by Hofmann's voltammeter.

Because pure water is a bad conductor of electricity, but acidified water conducts electricity.

$$2H_2O \xrightarrow{\text{few drops of acid + electricity}} 2H_2 \uparrow + O_2 \uparrow$$

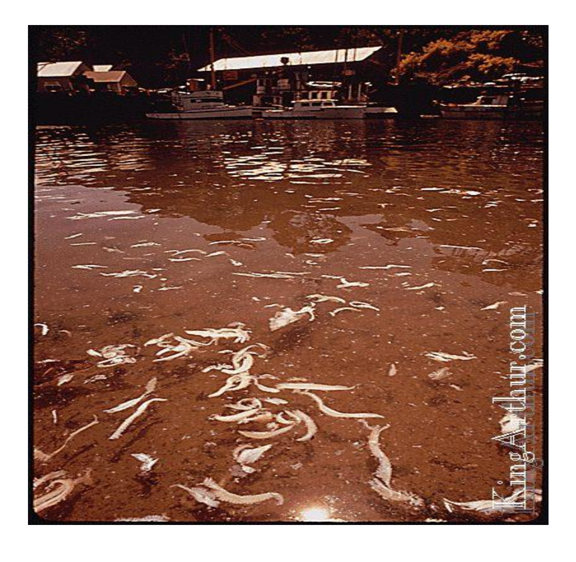
Water pollution:-

Any change in the natural properties of water that harm living organism's health

OR

It is the addition of any substance to the water which causes continuous change in water properties and affecting the health and the life of living

a- Natural water pollutant	b- Artificial water pollutant
They arise from natural phenomena like.. • Volcanic eruptions. • Death of living creatures. • Lightning accompanying thunder storms.	- They arise from different human activities. and include 4 types as shown in the following table :





Kind of pollution	Its causes (origin)	Its harms (damages)
1. Biological pollution.	Mixing animals and human wastes with water.	The infection by many diseases such as: - Bilharzia, - Typhoid and - Hepatitis.
2. Chemical pollution.	Throwing wastes and remaining of factories in water canals and rivers.	The increase of some elements concentration causing great harms **1. Lead** → death of brain cells. **2. Mercury** → blindness. **3. Arsenic** → liver cancer.
3. Thermal pollution.	Increasing the temperature of some water areas used in cooling the nuclear reactors.	Death of marine creatures due to the separation of the dissolved oxygen from water.
4. Radiant pollution.	- Dumping the atomic wastes in oceans and seas. - Leakage of radioactive material from nuclear reactors.	

Note :
The nuclear reactors cause both of thermal pollution and radiant pollution.

Protection of water pollution :

There are many behaviors that must be taken in consideration to protect water from pollution in Egypt, such as :

1-Preventing of getting rid of sewage, wastes of factories and dead animals in rivers or canals.

2-Developing the stations of water purification and do a periodical analysis to water used in drinking.

3-Disinfection of the drinking water tanks which are found on the roofs of buildings in a periodical manner.

4-Don't store the tap water in empty plastic bottles, because plastic reacts with chlorine gas (used as water disinfectant) leading to the increase in the infection rates by cancer.

5-Spreading environmental awareness among people to protect water from pollution

Date:…./…./……….

Exercise



1-Choose:

1- Density of water at 4^0C is …….. its density at room temperature .

a.more than b. less than c. equal to

2- Water has ……… effect on litmus paper.

a.acidic b. alkaline c. neutral

3-In Hoffman's voltmeter hydrogen gas collected at……

a.cathode b. anode c. Positive pole

4-From diseases of biological pollution is ……..

a.fever b. Bilharzia c. common cold

5-If the summation of the volume of the 2 evolved gases at the 2 poles of Hoffman's voltmeter is 60 cm^3 , so the volume of hydrogen and oxygen gases respectively is ….

a.20 , 40 b. 40 , 20 c.30 , 30

UNIT 2

Lesson one

The atmospheric layers

Atmospheric air or envelope :

Is The gaseous envelope rotating with the earth around its axis and extends about **1000** km above the sea level".

Atmospheric pressure :

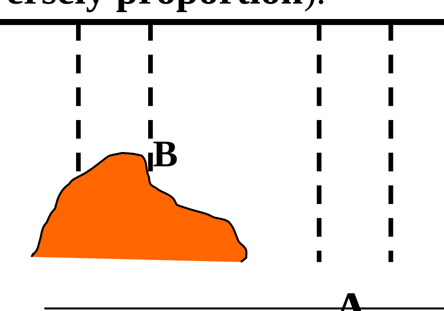
The weight of air column act on a unit area.

- The atmospheric pressure is measured by **unit** called **bar (or) millibar.**

1 bar (b) = 1000 millibar

- The atmospheric pressure differs from one place to another according to the change of height from sea level.

(**The relation between elevation & pressure is inversely proportion**).



At (A)

As the **elevation** above sea level **decreases** (Length of air column increases), the **atmospheric pressure** **increases.**

At (B)

As the **elevation** above sea level **increases** (Length of air column decreases), the **atmospheric pressure** **decreases.**

* Therefore, the atmospheric pressure at point (**B**) is **less than** that at point (**A**).
* Normal atmospheric pressure at sea level = **1013.25** millibar
* The device used to measure the atmospheric pressure is called **Barometer.**

N.B.: The **density** of air **decreases** by **increasing** the **elevation** above sea level.

- The atmospheric pressure is measured by instruments called **barometers**.

Aneroid	**Altimeter**
- It is type of barometers. - Used to **determine the possible day weather**.	– It is an instrument used by pilots in planes to **measure the elevation from sea level based on the atmospheric pressure.**

** Atmospheric pressure map:

- It is a map shows the atmospheric pressure at different points.

1- Points of **equal pressure** are joined by **curved** lines called **Isobar**.

2- Centre of **low atmospheric pressure areas** is represented by "**L**".

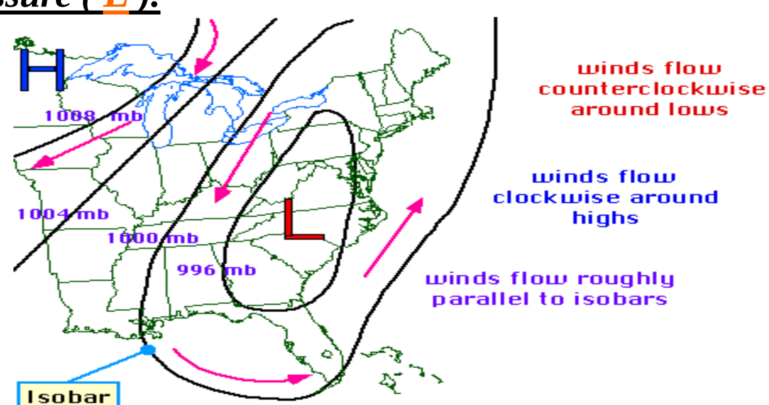
3- Centre of **high atmospheric pressure areas** is represented by "**H**".

4- The wind moves from areas of high atmospheric pressure (H)

to the areas of low atmospheric pressure (L).

N.B.The pressure is inversely

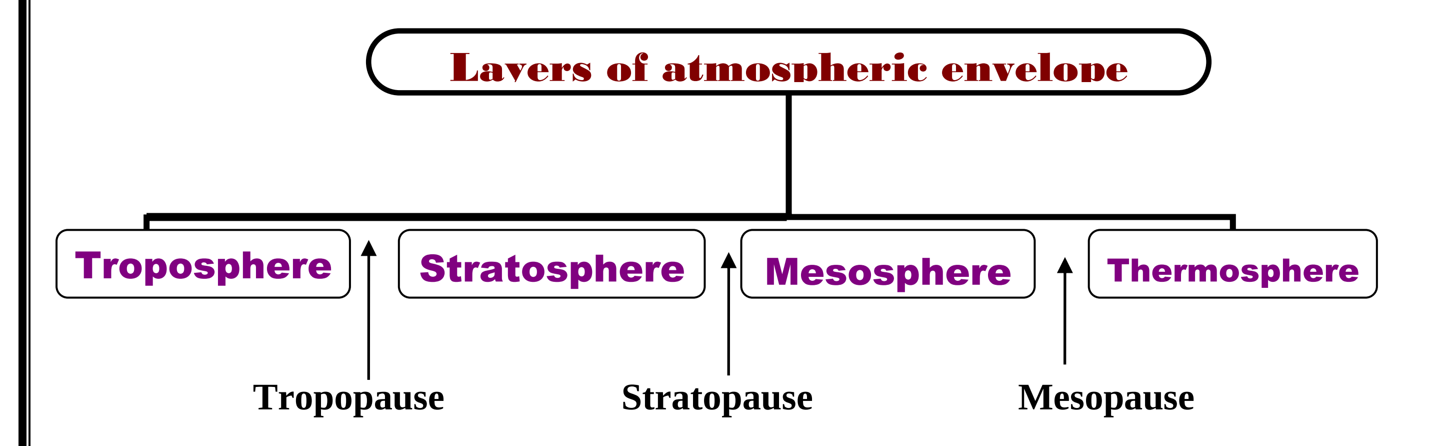
Proportional with altitude.



Isobar:- **It is the curved lines that join the point of equal pressure in atmospheric Pressure map**

P.O.C.	Troposphere layer	Stratosphere layer	Mesosphere layer	Thermosphere layer
Information	It means disturbed <u>*Bec. All weather changes occur in it*</u>.	Called "Ozone atmospheric envelope".	Middle and Coldest layer.	Called "Thermal layer" <u>*Bec., it is the hottest layer.*</u>
Height And Thickness	Thickness <u>13 Km</u>	-<u>50 km</u> above sea level. -Thickness is <u>37 km.</u>	- <u>85 km</u> above sea level. - Its thickness is <u>35 km</u>.	- <u>85 km</u> km above sea level. -Thickness is <u>590 km</u>
Temperature of this layer	- Decreases by <u>6.5°c</u> for each <u>1 km</u> upward. Till it reaches (-60°c)	- Increases from <u>(-60°c) to (0°c)</u> at its end. <u>Due to presence of Ozone layer that absorb Ultraviolet rays</u>	-Decreases from <u>(0°c)to (-90°c)</u> at its end. So, it is called "Coldest layer".	- Increases with high rate till it reaches at its end <u>1200°c</u>
Atmo-spheric Pressure	- Decreases as we go upward till it reach at its top. <u>100 mb</u>	- Decreases as we go upward till it reach at its top. <u>1mb</u>	- Decreases as we go upward till it reach at its Top <u>0.01mb</u>	No pressure
Air Move-ment	<u>Vertical</u> -Hot air currents (less density) move upwards. - Cold air currents (high density) Move downwards.	<u>Horizontal</u> - No Clouds or weather disturbances. So, Pilots prefer to fly in this layer.	No air movement	No air movement

Contain	- 75% of the atmosphere mass. So, all atmospheric phenomena take place in this layer as rain, wind & cloud. - 99% of atmospheric water vapour. So, it organizes the temperature on Earth	-Ozone layer at height 20 : 40 Km Above the sea level	-Has Limited quantities of Helium & Hydrogen So, it is vacuumed (highly rarefied). - luminous meteors Formed in it Due to its friction with air molecules.	- Charged ions in the upper part extend up to 700 km above sea level. So, This part is known as (Ionosphere).



Regions between 2 layers where the temperature remains constant.

Temp.at certain height= temp.at sea level-(height km x6.5)

Problems

If the temperature on the surface of a mountain of height 2 Km. equals 16 C◦ Calculate the temp. at the bottom of the mountain.

Answer:-

The temp. at the bottom of the mountain=(2 x6.5) +16 =29 C◦

Another solution:-

The decrease in temperature = Height x 6.5C◦ = 2 x 6.5 = 13 C◦

The temp. at the mountain's bottom= Temp. at the top + decrease in temp.

= 13 + 16 = 29 C◦

**** Ionosphere layer :**

It is a layer that contains **charged ions** and it has an important role in wireless **communications** and **Broadcasting.**

Because it reflects the radio waves transmitted by radio stations and communication centers.

- It is surrounded by **two magnetic belts** known as **Van-Allen belts** which play role in **scattering** of harmful Charged cosmic radiations away from the Earth , this scattering causes the occurrence of **Aurora** phenomenon.

Van Allen belts They are **two magnetic belts** Surrounding Ionosphere and play an important role in scattering of Harmful charged cosmic radiations.

Aurora phenomenon : It is a phenomenon that appears as **brightly** colored light curtains seen from the both poles (North & South) of the Earth .

**** Exosphere :**

- It is a region in which the atmospheric envelope is **inserted** with outer space.

- In this region, Satellites rotate around the Earth with cameras and telescopes.

Satellites are used to transmit weather condition & TV program

Date ……/……./…….

Exercise

The Atmospheric layers

[1] Write the scientific term :

1- A unit used for measuring atmospheric pressure. (……………….)

2-The region between troposphere & stratosphere where the temperature remains constant. (………..………)

3-The atmospheric layer in which the Ozone layer is located. . (……….. ……..)

4- A barometer used to determine the possible day weather. . (……………….)

[2] Give reason :

1-The lower part of stratosphere is suitable for flying airplanes.

……………………………………………………………………………………………

……………………………………………………………………………………………

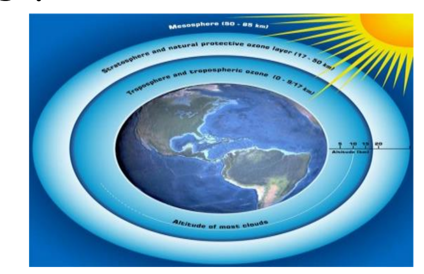
Lesson two

Erosion of Ozone layer and global warming

Earth planet faces two dangerous phenomena :-

1-Ozone layer deletion. **2-Global warming phenomena.**

First:- Erosion pf ozone layer



Position of ozone layer :-

Ozone layers located at height **20- 40 km** above the sea level in the lower part of **stratosphere** layer.

Because

-It is the 1st. layer of atmospheric envelope that meets ultraviolet radiations coming from the sun

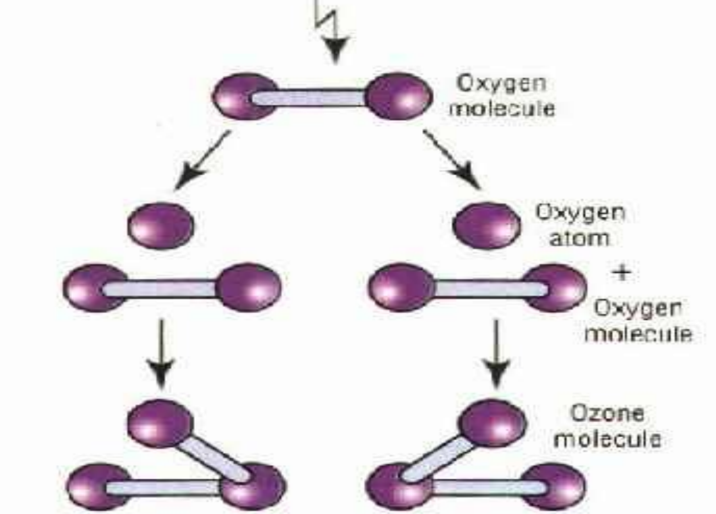
-It contains suitable amount of Oxygen gas.

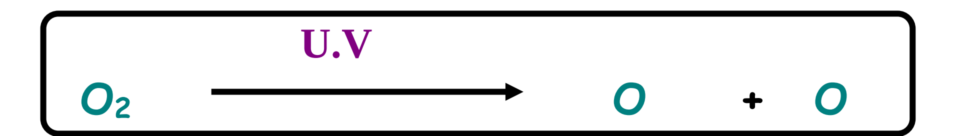
Structure of Ozone layer :-

It is composed of ozone gas (O_3) which consists of three oxygen atoms.

Formation of ozone gas.

1- Oxygen (O_2) absorbs ultraviolet radiation, which causes the break down of bonds between two oxygen atoms forming two free oxygen (2 O)





2-Each **oxygen** atom combines with an **oxygen molecule** forming ozone molecule (O_3) .

$$O_2 + O \longrightarrow O_3$$

Thickness of ozone layer :-

Temperature & pressure at Ozone layer differ from those at Earth's surface.

1-The thickness of ozone layer is

a-**20 km** at normal pressure (1mb) in **stratosphere** & temp. less than that at sea level.

b- **3mm in STP** Standard temp. & pressure , The scientist **Dobson** Postulate that the thickness of ozone layer is compressed in STP = Standard temp. & pressure .

c-**300 Dobson unit**

(1 mm = 100 Dobson)

* **Dobson** is measuring **unit** of degree for Ozone layer.

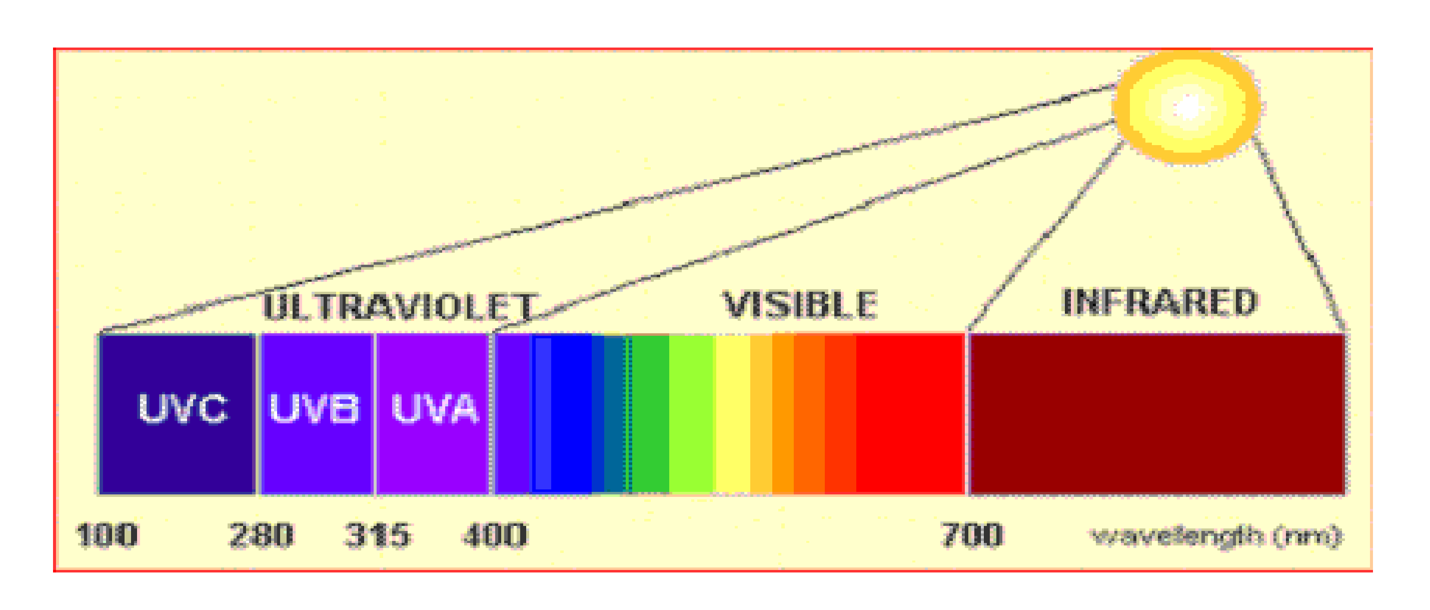
Importance of Ozone layer :-

-The Ozone layer acts as a **protective shield** for living organisms **against** harmful chemical effects of **ultraviolet radiations (UV)**.

-To Know how it acts as a protective shield , we should know the types of ultraviolet radiations.

There are three types of (UV) rays that differ in wave length and their effects :-

Near ultraviolet rays UV-A	Medium ultraviolet rays UV-B	Far ultraviolet rays UV-C
100% of these rays **penetrate** ozone layer	**95%** of rays **don't penetrate** ozone layer	**100%** of these rays **don't penetrate** ozone layer



Erosion of ozone layer"-

It means thinning or losing parts of ozone layer

G.R. Erosion of Ozone layer increases in September

Because all pollutants material and black clouds are pushed by wind towards south pole making ozone hole which increase from year to year.

The most dangerous pollutants	Used as
1 – **Chlorofluorocarbon** compounds (CFC) known as **Freon**.	- **Cooling** substance in air-conditioning sets. -**Aerosols**. -Substances making **foam** backing. - **Solvent** substances for **cleaning** electric circuits slides.
2- Methyl bromide gas	- An **insecticides** to **preserve** stored agricultural **crops**.
3- Halons	-Materials in **fire extinguisher**
4- Nitrogen oxide	- Produced from burning of fuel of **ultrasound airplane** (Concorde)

Protecting the ozone layer:-

1-Using **(CFC)** compounds must be **reduced** & find **safer** alternatives.
2-**Stop** producing the ultrasound **Concorde** planes.

The statement **NON (CFC)** which is written in insecticide means that these products don't contain **(CFC)** compounds.

Second :- Global warming phenomenon

Global warming phenomenon:-
It is the continuous **increase** in the average temperature of the earth's near surface air .



*Global warming is **caused by** the green house effect.
* The temp. of planet Earth has been increasing since 1935 due to greenhouse gases especially CO_2
(From 0.03% to 0.038%)

***The reasons for increasing (CO_2) gas ratio in the atmosphere**

1- Fossil fuel burning 2- Cutting trees. 3-Forest fire.

The most important green house gases :-

1-Carbon dioxide gases . **(CO_2)**
2-Nitrous oxide **(N_2O)**
3-Chlorofluorocarbon compounds **(CFC).**
4-Methane gas. **(CH_4)**
5-Water vapour. **(H_2O)**

Interpretation of a green house phenomenon:-

When the concentration of **green house gases** increases in the atmosphere, the atmosphere plays the role of **glass** in the **green house** as :-

1- It permits the **visible light & short wave length rays** produced from sun to **pass**.

2-The earth and its components **absorb** these rays and **reemit** the radiation back in the form of **infrared** radiation (**long wave length**)

3-The infrared radiation can't penetrate the atmosphere, bec. it's **long** wave length So it is kept **trapped** in troposphere causing the **rise** of planet earth temperature.

Green house phenomenon:-

It is the trapping of the **infrared** radiation in the troposphere layer due to the **increase** of the ratio of **green house gases** which causes the **increase** of planet earth **temperature**.

*** Note** :

Ultraviolet rays has chemical effect

Infrared rays has thermal effect.

***The negative effects of global warming phenomena :-**

1-Melting of polar ice and snow of both south and north poles lead to increase the water level in seas & oceans :-

a- The coastal area could drawn.
b- Extinction of some polar animals like the polar bear & Seals.

2-Severe climate change :-

a- Tropical hurricanes e.g hurricane Katrina in 2005.
b- Destructive floods.
c- Drought waves.
d- Forests fires.

These bad destructive effects can be controlled by:-

1- **Reducing** the ratio of bad gases by stopping burning of fossils fuel
2- Searching friendly energy resources.

Date …… /………/………

Exercise

Erosion of Ozone Layer and Globawarming

1) - Write the scientific term :-

a- A type of ultraviolet radiations that is absorbed completely (100%) by the ozone layer . (..)

b- Thinning or losing parts of ozone layer. (..)

c-A molecule is formed by combining an atom of an element with molecule of the same element . (..)

d-An atmospheric layer acts as a shield that protects living organisms from the danger of ultraviolet radiation . (.......................................)

2) Choose:

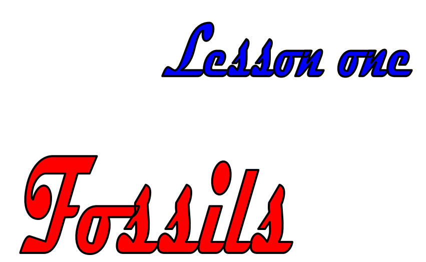
1-All the following are greenhouse effect gases except….

a.CFC b. methane c. Halons

2- ………….. rays has chemical effect.

a.Infrared b. Ultraviolet c. X-Ray

UNIT 3



Fossils an exciting world.... a story told by rocks.... tells us about the deep past, millions years ago even before the creation of man on Earth.

Fossils:

They are traces and remains of old living organisms that are preserved in sedimentary rocks.

Traces: Traces indicate the activity of once an old living organism during its life.

Examples of trace : **Worm tunnels , shells**

Remains: Parts indicate the remains of once an old living organism after death.

Examples of remains :

shark tooth , dianosours skull





Types of fossils & ways of formation:-

Fossils are classified according to the way of formation (or preservation) into several types from which :

1. Fossil of complete body
2. Cast
3. Mold
4. Petrified fossils

Fossil of complete body :

- It is a type of fossils which was formed due to rapid burying of the organism as soon as it died in a medium which preserves it from decaying as snow and amber

- It keeps the whole shape and all the details of the body.

Examples of complete body fossil :

- Mammoth (a type of elephants) was extinct by the snow.
- When it died and rapidly **buried in snow**, its body doesn't decompose.
- The first mammoth fossil was discovered in last century, which keeps the **whole shape, hair, flesh and food.**



Amber fossil :

• During some old geologic ages, there were common pine trees, which secreted resinous matter that covers insects.

- After the resinous matter solidifies, it changes into **amber** which preserves the bodies of these insects inside it from decomposition.

Amber :

It is the solidified resinous matter which was secreted by pine trees.

Mold:

the replica of the internal details of a skeleton of once an old living organism.

Examples:

Ammonite



Nummulite



Trilobite



How is the ammonites mold formed:

When a snail dies, it falls on the sea floor, where its soft parts decomposed leaving the shell which is buried in sediments.

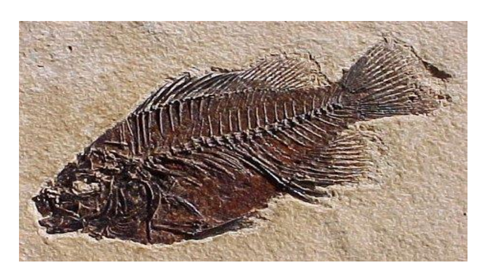
- The sediments fill up the shell cavities and solidify as the time passes.
- The shell decomposes completely, leaving a solid rock cast carrying the internal details of the snail.

Cast:



_**It is the replica of the external details of a skeleton of one an old living organisms.**

Examples of the cast fossils:-



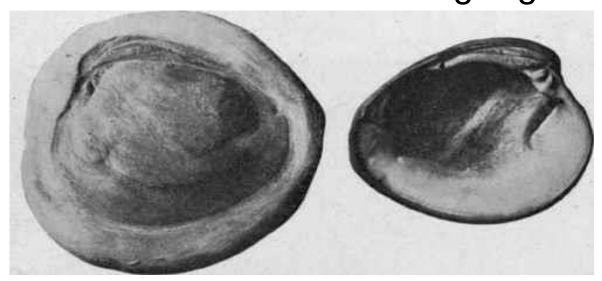
Fish Mold



Ferns Mold

Note:

In the sedimentary rocks, mold or cast can be formed for once an old living organism.



Petrified fossils:-

They are fossils, in which minerals replace the organic matter for organism part by part leaving the shape without any change.

Examples of petrified fossils :

Petrified woods :

G.R. Naming the petrified forests with wood mountain.

Because it contains petrified woods which look like rocks.

G.R Petrified woods are considered from fossils although they look like rocks.

Because they give us the details about the life of once an old plant.

Petrified woods:

They are fossils which are formed as a result of replacing the organic matter of wood by the silica part by part and they give us details about the life of once an old plant.

Petrification:
It is the process of replacing the wood material of trees by silica to form petrified woods part by part

Suitable conditions for fossils formation (or preservation):

1. Presence of hard skeleton of organism.
2. The organism body must be buried immediately after death in a medium that preserves it from decomposition
3. The existence of a suitable medium in which the mineral material replaces the organic material of the living organism.



Importance of fossils:-

1-Age determination of sedimentary rocks.
2. Figuring out the paleoenvironment.
3. Studying life evolution
4. Petroleum exploration

1]Age determination of sedimentary rocks :

The index fossils indicate the age of sedimentary rocks, because the age of rocks is the same age of fossils existed in them.

Index fossils:

They are fossils of organisms that had lived for a short period of time in the past and had a wide geographic distribution, then became extinct.

[2] Figuring out the paleoenvironment:

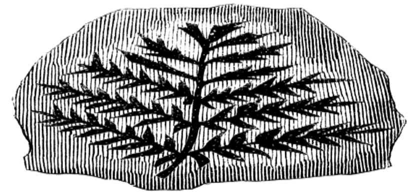
Fossils give an idea about the environment in which they lived during the old geologic ages and also they indicate the climate of these ages.

Examples:-

1. Nummulites fossils:-

They are found in the limestone rocks of **Gebel El-Mokattam** and they indicate that there was a sea **floor in** this area more than 35 million years ago.

2. Ferns fossils



They indicate that the environment where they lived was a hot and rainy tropical environment.

3. Coral fossils:



They indicate that the environment where they lived was clear warm shallow seas.

3-Studying life evolution:

Fossil record:

The fossils that exist in the rocks of different areas that indicate the extinction and evolution of organisms.

Studying the fossil record showed that :

(1) The life started first in sea. Then established on land.
(2) Organisms always developed from simple to complicate as….
-Invertebrates before the vertebrates.
- In the vertebrates Fish , Amphibians , reptiles , Birds then Mammals

Archaeopteryx fossil

is considered a link between reptiles and birds.

4-Petroleum exploration:

- When searching for petroleum, geologists take samples from the rocks of the exploratory wells.

- These samples are studied under microscope. If they contain microfossils like **foraminifera and radiolarian**

This cloud point to:

- The age of rocks existed in exploratory wells.
- The conditions are suitable for petroleum formation.



Radiolaria



Foraminifera

Date: …. /…./………. **Exercise**

Fossils

1.Give reasons for :

1. Mammoth fossil is preserved as a complete body fossil.

……………………………………………………………………………………….

2.Choose the odd word out, then write the suitable name for others :

1. Cast - Fossil of complete body - Fossil record - Mold.

………………………………………………………………………………………..

2. Trilobite fossil - Nummulites fossil - Fossil of ferns - Ammonites fossil.

………………………………………………………………………………………..

3. Choose the correct answer:

1- ………….. is an animal that links between birds and reptiles.

a. Mammoth b. Amber c. Archaeopteryx

2-Amber is resinous matter secreted from …….. tree.

a. Fern b. Pine c. Palm

Lesson two: Extinction

Extinction

It is the continuous decrease without compensation in the number of a certain species of living organisms until all members of species die out.

The moment of extinction

It is the date of death of the last individual of that species.

Using fossils to indicate extinction.

- The fossils in rocks are known as **the fossil record** .
- It indicates the extinction of species of one living organisms have appeared & extinct before the creation of man.

Studying of the fossil record shows :-

1- About 98% of organisms appeared & became extinct before creation of man as dinosaurs.

2- The ratio of living organisms now does not exceed **2%** of the total species that have appeared since the establishment of plant Earth.

3-Fossils of some fish, reptiles & birds aren't similar to their living counterparts now, as shown in the following figures:



Dinosaur Fossil



Fish Fossil



Archaeopteryx Fossil

Factors causing extinction of species

(A) Causes of old extinctions :

1- Meteorite impacts with Earth.

2- The onset of a long glacial age.

3- Emission of poisonous gases from active volcanoes.

(B) Causes of recent extinction :

1-Destroying natural habitat.

2- Environmental pollution.

3- Over hunting.

4- Climatic changes and natural disaster.

1- Destroying natural habitat:

Over cutting of forests trees destroy the habitat of these species leaving them homeless .

2-over hunting:

Over hunting causes extinction due to:

a –Absence of laws that control wild animal hunting at the beginning of the 20th century.
b -The progressive development in the technology of hunting weapons.
c - The increased rate of interest in animal's skins and furs.

3- Environmental pollution:

Since the industrial revolution in **1750** pollution has propagated in all ecosystems

Examples of environmental pollution :

a- **Acidic rains** → fall which destroy the forests trees .

b- **Chemical insecticides** → that break down the food chains.

c- **Oil leaks** → in oceans and seas causes the death of marine birds

4- Climatic changes & natural disasters:

* **Some of these disasters are related to the climatic changes such as:**

1- Drought 2- Tornadoes 3- Floods 4- Lightning













5- Torrents 6- Storms 7- The rising temperature of Earth planet







* **Other disasters are not related to climatic changes such as:**

1- Earthquakes 2- Volcanoes



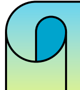


3- High marine tide (Tsunami waves)









The extinct and endangered species:-

First: The extinct species:

Examples of some extinct species in the old times:

e.g. **Dinosaurs & Mammoth .**

Examples of some extinct species in the recent times :

1- Dodo bird. **2- Quagga.** **3- Passenger pigeon.**

4- Australian wild cat (Tasmanian cat). **5- Golden frog.**



Dodo bird**: due to reduce size Of wings & legs.**



Quagga: Mammal considered as midway Between horse & Zebra

Second: The endangered Species:

(IUCN): The International Union for Conservation of Nature

- It was established to protect the endangered species.

- It issues every year **A RED LIST** which is a list of endangered species and the endanger level, of each species according to :-

(1) The rates of decreasing or increasing in the numbers of the species.

(2) Its stability in its environment.

The endanger level is classified in an ascending order into three levels, which are:

1-Vulnerable (VU) **2-Endangered (EN)** **3-Critically Endangered (CR)**

Examples of some endangered species

1- Panda bear.



2- Rhinoceros.



3- Bald eagle.



4- Ibis bird



5- Arwa Ram.



6-Papyrus plant



Effect of extinction on the ecologic equilibrium

Ecosystem : is everything that is related to living and non living things existing somewhere.

Food chain: It is a path of energy that transmits from a living organism to another in the ecosystem.

Food web: It is a group of food chains connected with each other.

Ecosystem is classified into:

According to the effect of extinction on it into:
(1) Simple ecosystem.
(2) Complicated ecosystem.

1) Simple Ecosystem	2) Complicated ecosystem
- It contains a few number of members of living organisms (Few members)	- It contains a large number of members of living organisms. (Multiple members)
- It is **affected** by the absence of one of its species **,because of the rarity of alternative that Compensates this absence** .	- It is **not affected** much by the absence of one of its species, **because it has many alternatives.**
EX.: Desert ecosystem .	**EX.**: Tropical forest ecosystem.

Ways to protect living organisms from extinction:

1-Issuing rules to organize and control hunting in the environment Especially for the rare types .
2-Increasing the awareness about the importance of natural life to continue the existence of mankind .
3- Reproducing the endangered species and sending them back to their Native habitats.
4- Establishing gene banks for the much endangered species.
5- Establishing natural protectorate areas.

Natural Protectorates : they are safe areas established to protect endangered species in their homeland

The important world's protectorates:

(1) Bluestone protectorate:
* **Location** : in USA
* **Protected Kinds** : Grey bear .

(2) Panda Protectorate :
* **Location** : In northeastern China .
* **Protected Kinds** : Panda bear.

(3) Ras Mohamed Protectorate :
* **Location** :In South Sinai governorate , Egypt .
* **Protected kinds** :Rare species of coral reefs and colored fish and numerous of rare plants and animals .

NOTES:

Ras Mohamed protectorate is the first established protectorate in Egypt in 1983.

In 2005, UNESCO

* Declared **Wadi Hetan** (part of wadi El – Raihan protectorates) as the best world heritage areas of whales skeletons , where it contains complete whales fossils 40 million years ago.

Date:…./…./……….

Exercise

Extinction

Choose :-

1……….… is the continuous decrease without Compensate in the number of a certain species is living organisms until all members of species die out.

a. Fossil   b. Extinction   c. petrification

2.…… ………………… is the date of death of the last individual of that species.

a. index fossil   b. date of extinction   c. record fossil

3.…………………………is from the extinct species.

a. Rhinoceros   b. Panda bear   c. Dodo bird

4. Rare coral reefs and colored fish are protected in ……… protectorate.

a. blue stone   b. Panda   c. Ras-Mohamed

5……………. Indicate extinction.

a.Endangered species   b. Extinct species   c. Fossils

Model Exam (1)

Q.1)Complete:

1-……………………….. is used in preservation of cornea of the eye.

2-………….. and …………..react instantly with water and Hydrogen gas evolves which burns with pop sound.

3- In ……………… periodic table, elements are arranged in ascending order according to its atomic mass .

4-………… Is an apparatus used to analyze acidified water.

5-………………………. is a series in which metals are arranged in a descending order according to their chemical activity.

6-........... indicate the activity of once an old living organism during its life, while ....indicate the remains of an old living organism after death.

Q.2)Write Scientific term:

1-Highly active nonmetals located on the right side of the periodic table. (……………………………..)

2-A kind of water pollution resulting from mixing animals and human wastes with water. (……………………………..)

3-Compounds that the difference in the electronegativity between its elements is relatively high. (……………………………..)

4-A metal that is used to transfer heat from inside nuclear reactor to outside. (………………………………)

5-A type of ultraviolet radiations that is absorbed completely (100%) by the ozone layer . (..)

Q.3) Give reasons for:

1-Elements of the same group have similar properties.

………………………………………………………………………………………

2-Water can dissolve sugar but can't dissolve oil.

………………………………………………………………………………………

3-Alkali metals are kept under kerosene or paraffin oil.

………………………………………………………………………………………

4-Liquid Nitrogen is used in preservation of eye cornea.

………………………………………………………………………………………

5-Radioactive Cobalt 60 used in food preservation.

………………………………………………………………………………………

Q.4) Name the organism that is indicated by each of the following statements :

1-A bird with small wings and short legs and is reported extinct in 1681.(………..…)

2-A mammal has a shape midway between horse and zebra. (…………………)

Model Exam (2)

1) Complete:

1. .... and .... are examples of traces of an old living organism.
2. .... and .... are examples of remains of once an old living organism after death.
3. Fossils are classified according to the ways of formation into fossil of complete body ...., ... and ....
4. .... is the continuous decrease without................ in the number of a certain species is living organisms until all members of species die out.
5. .... is the date of death of the last individual of that species.
6. .... indicate the extinction of species of living organisms.

2) Write Scientific term:

1- Thinning or losing parts of ozone layer. (...)

2-A molecule is formed by combining an atom of an element with molecule of the same element . (...)

3-An atmospheric layer acts as a shield that protects living organisms from the danger of ultraviolet radiation . (...)

4- A type of ecosystem that characterized by few number of member. (...................................)

5- Safe area for the endangered species to live as in their home land. (...................................)

3) Give reasons for:

1-The atmospheric pressure decrease by increasing the elevation above sea level.

....

2-The lower part of stratosphere is suitable for flying airplanes.

....

3-Troposphere layer regulates the Earth's temperature.

……

4- Simple ecosystem affected by absence of one of its species.

……

5- Establishing several natural protectorates.

……

Q.4) If the temp. at the base of the mountain is (20.6 ºC) , find the temp.at its top if the height is 8862 meters above the Earth's surface.

……

……

Model exam (1) Answers

Q.1

1.Liquid nitrogen 2.Sodium , potassium 3.Mendeleev's
4.Hoffman's voltmeter 5.Chemical activity series
6.traces , remains

Q2.

1.Halogens 2.Biological pollution 3.Polar covalent compounds.
4.Liquid sodium 5.Far ultraviolet rays

Q3:

1.Bec., their outer most energy levels have the same number of electrons.
2.Bec., sugar can make hydrogen bond with water while oil can't.
3.To prevent their reaction with water vapor in air as they are very active metals that react quickly with wet air produce hydrogen gas that burn with pop sound.
4.Dueto its low boiling point (-196 ^{0}c)
5.Bec.,it emits Gamma rays that can kill microbes.

Q4:

1-Dodo bird
2-Quagga

Model exam(2) Answers

Q.1

1.worm tunnels , shells 2.Dinausors skull , shark tooth.

3.cast ,mold and petrified fossils. 4.Extinction , compensate.

5.Moment of extinction 6.Fossils.

Q2.

1.Ozone hole 2.Ozone molecule 3.Ozone layer
4.Simple ecosystem 5. Natural protectorates.

Q3:

1.Dueto decrease length of air column.
2.Bec., the air moves horizontal and there is no weather phenomena.
3.Bec., 99% of water vapour found in troposphere.

4.Dueto few alternatives.
5.To protect endangered species and help them live in their home land.

Q4:
Temp. at top = temp. at base – (6.5 x hight) {8862 \1000 =8.862 Km}
= 20 _ (6.5 x8.862)
= - 37.603 °C

Practical revision sheet

1.Compare with chemical equations only between the effect of dilute HCl on piece of Magnesium and piece of copper.

_ Mg + 2HCl $\xrightarrow{\text{dilute}}$ $MgCl_2$ + $H_2 \uparrow$

_ Cu + HCl $\xrightarrow{\text{dilute}}$ No Reaction.



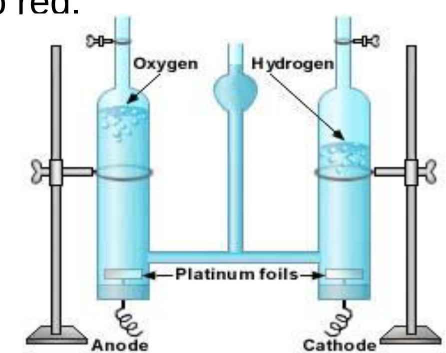


2.Compare between Magnesium oxide and Carbon dioxide in the lab.

_ By adding water to get their solution , then use litmus paper
_ 2MgO + H_2O $\longrightarrow$ Mg $(OH)_2$ (alkaline oxide)
Magnesium hydroxide (alkali) change red litmus paper into blue

_ CO_2 + H_2O $\longrightarrow$ H_2CO_3(acidic oxide)
Carbonic acid (acid) change blue litmus paper into red.

3. a. Mention the name of the device
b.Mention the use of the device
c. Mention the name of the gas collected at anode and that collected at cathode with comparing their volumes
d. Mention its chemical equation .



answer:
a.Hofmann's Voltmeter
b. used for the electrolysis of acidified water
c. Hydrogen at cathode , Oxygen at cathode , Volume of hydrogen is double volume of oxygen

d. $2H_2O \xrightarrow{\text{few drops of acid + electricity}} 2H_2\uparrow + O_2\uparrow$

4. Name & Classify the following sample into endangered or extinct species



Panda Mammal
Endangered species



Rhinoceros Mammal
Endangered species



Quagga Mammal
Extinct species



Dodo bird
Extinct species



Bald eagle bird
Endangered species



Ibis bird
Endangered species

Good luck